

FBI LABORATORY

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1 5. The apparatus of claim 4, wherein the radio port receives operating
2 power from the integrated circuit device's power supply.

1 6. The apparatus of claim 4, wherein the radio port receives operating
2 power from a battery.

1 7. The apparatus of claim 4, wherein the radio port receives operating
2 power from radio waves received on the antenna.

1 8. The apparatus of claim 4, wherein the antenna is incorporated into
2 the integrated circuit device.

1 9. The apparatus of claim 4, wherein the antenna is a trace on a
2 printed-wire board.

1 10. The apparatus of claim 4, wherein the antenna is a separate wire.

1 11. The apparatus of claim 1, wherein the radio port includes a
2 collision detection mechanism that is configured to detect a collision when more
3 than one response is received simultaneously.

1 12. The apparatus of claim 11, wherein the radio port includes a
2 collision recovery mechanism that is configured to resolve collisions when more
3 than one response is received simultaneously.

1 13. An apparatus that facilitates communication with an integrated
2 circuit device within a computing system, comprising:

3 the integrated circuit device;
 4 a radio port coupled to the integrated circuit device;
 5 an antenna coupled to the radio port;
 6 wherein the antenna is configured to detect a radio signal and pass the
 7 radio signal to the radio port;
 8 wherein the radio port includes a receiving mechanism that is configured
 9 to receive the radio signal from the antenna;
 10 wherein the radio port includes a passing mechanism that is configured to
 11 pass control commands to the integrated circuit device in response to the radio
 12 signal; and
 13 wherein the radio port further includes a transmitting mechanism that is
 14 configured to transmit a response to the radio signal that is generated by the
 15 integrated circuit device.

1 14. The apparatus of claim 13, wherein communication with the
 2 integrated circuit device includes communication and monitoring of boundary-
 3 scan data, self test data, power and temperature data, chip identification data, and
 4 configuration data.

1 15. The apparatus of claim 13, wherein the radio port is incorporated
 2 into the integrated circuit device.

1 16. The apparatus of claim 15, wherein the radio port receives
 2 operating power from the integrated circuit device's power supply.

1 17. The apparatus of claim 15, wherein the radio port receives
 2 operating power from a battery.

1 18. The apparatus of claim 15, wherein the radio port receives
2 operating power from radio waves received on the antenna.

1 19. The apparatus of claim 15, wherein the antenna is incorporated into
2 the integrated circuit device.

1 20. A system that facilitates communication between a test device and
2 a plurality of integrated circuit devices within a computing system, comprising:
3 the test device;
4 the plurality of integrated circuit devices;
5 a radio transmitter at the test device for transmitting a command from the
6 test device to the plurality of integrated circuit devices; and
7 a radio receiver at the test device to receive a response from each
8 integrated circuit device of the plurality of integrated circuit devices.

1 21. The system of claim 20, wherein communication with the plurality
2 of integrated circuit devices includes communication of boundary-scan data.

1 22. The system of claim 20, wherein the command from the test device
2 includes one of, an initialization command, a configuration command, and a
3 report status command.

1 23. The system of claim 20, wherein the response from each integrated
2 circuit device includes one of, a success response, a failed response, and a status
3 message.

1 24. The system of claim 20, wherein the radio receiver includes a
2 collision detection mechanism configured to detect collisions between multiple
3 simultaneous responses from the plurality of integrated circuit devices.

1 25. The system of claim 24, wherein the radio receiver includes a
2 collision resolution mechanism configured to resolve collisions between multiple
3 simultaneous responses from the plurality of integrated circuit devices.

1 26. A method for communicating among a plurality of integrated
2 circuit devices within a computing system, comprising:
3 broadcasting a command from a radio port coupled to a control device,
4 wherein the control device is one of, a testing device, a system controller, a central
5 processing unit, and a first integrated circuit device within the plurality of
6 integrated circuit devices;
7 receiving the command at a second integrated circuit device within the
8 plurality of integrated circuit devices;
9 transmitting a response to the command from the second integrated circuit
10 device; and
11 receiving the response at the control device.

1 27. The method of claim 26, wherein communication among the
2 plurality of integrated circuit devices includes communication of boundary-scan
3 data.

1 28. The method of claim 26, wherein the command includes one of, an
2 initialization command, a configuration command, and a report status command.

1 29. The method of claim 26, further comprising:
 2 detecting a collision between simultaneous responses from the plurality of
 3 integrated circuit devices; and
 4 resolving the collision between simultaneous responses from the plurality
 5 of integrated circuit devices.

1 30. The method of claim 26, wherein communicating among the
 2 plurality of integrated circuit devices within the computing system includes using
 3 one of, multiple radio channels, spread spectrum radio communications, and
 4 polling from the control device to avoid collisions.

1 31. The method of claim 26, further comprising acting on the
 2 command at the second integrated circuit device.

1 ^{Sub} 32. An apparatus that facilitates communication with an integrated
 2 circuit device within a computing subsystem within a computing system, wherein
 3 the computing subsystem is separated from other computing subsystems within
 4 the computing system, comprising:
 5 the computing subsystem including the integrated circuit device;
 6 a radio port coupled to the integrated circuit device, wherein the radio port
 7 includes a transmitting mechanism that is configured to generate a radio signal in
 8 response to a command from the integrated circuit device;
 9 an antenna coupled to the radio port external to the computing subsystem,
 10 wherein the antenna is configured to transmit the radio signal generated by the
 11 transmitting mechanism, and wherein the antenna is additionally configured to
 12 detect a response to the radio signal; and

13 wherein the radio port further includes a receiving mechanism, wherein the
14 receiving mechanism is configured to receive the response from the antenna and
15 pass the response to the integrated circuit device.